PE TITLE: USAF Modeling And Simulation

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

February 1999

BUDGET ACTIVITY

PE NUMBER AND TITLE

7 - Operational System Development

0207601F USAF Modeling And Simulation

	<u> </u>										
	COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	19,670	14,478	18,299	17,782	15,055	11,333	11,569	11,810	Continuing	Continuing
1008	National Air and Space Warfare Model (NASM)	14,530	12,756	12,605	12,016	11,275	7,461	7,617	7,775	Continuing	Continuing
1011	Joint Model Trasition (JMT) Program	0	0	0	0	0	0	0	0	Continuing	Continuing
2888	Theater Air Command & Control Sim Facility	5,140	0	0	0	0	0	0	0	Continuing	Continuing
4566	Executive Agent for Air/Space Natural Environment*	0	0	0	0	0	0	0	0	Continuing	Continuing
4567	Joint Modeling and Simulation System (JMASS)	0	1,722	5,694	5,766	3,780	3,872	3,952	4,035	Continuing	Continuing
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

^{*}Projects 1011 and 4566 were transferred to PE030861F beginning in FY 1999. Project 2888 was transferred to PE0207605F beginning in FY 1999. Reported in Justification Sheet for consistency.

(U) A. Mission Description

Program Element provides RDT&E funding for major USAF Modeling and Simulation efforts such as the National Air and Space [Warfare] Model (NASM)—the air and space element of the Joint Simulation System (JSIMS); the Joint Modeling and Simulation System (JMASS); and manpower authorizations for JSIMS. JSIMS will be the sole readiness training simulation used by all CINCs, Services, NAFs and at all simulation centers to train Joint Force Commanders, Joint Task Force staffs, Components and their staffs, including Joint Force Air Component Commanders and Air Operations Center personnel. JMASS provides High Level Architecture (HLA)-compliant architecture for engagement level simulations.

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Exhibit R-2 (PE 0207601F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE

February 1999

BUDGET ACTIVITY

PE NUMBER AND TITLE

7 - Operational System Development

0207601F USAF Modeling And Simulation

(U) B. Budget Activity Justification

Initiated in FY 94, this program is in budget activity 7 - Operational System Development, Research Category because it provides RDT&E funding for major USAF Modeling and Simulation efforts.

(U) C. Program Change Summary (\$ in Thousands)

					Total
	FY 1998	FY 1999	FY 2000	FY 2001	<u>Cost</u>
(U) FY99 President's Budget	19,807	14,899	17,621	16,099	Continuing
(U) Appropriated Value	21,718	14,899			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-1,410	-114			
b. SBIR	-503				
 c. Omnibus or Other Above Threshold Reprogram 					
d. Below Threshold Reprogramming					
(U) Adjustments to Budget Years Since FY 1999 PB			+1,678	+1,683	
(U) Current Budget Submit/ FY2000 PB	19,670	14,478	19,299	17,782	Continuing

(U) Significant Program Changes: Funding from PE64256F, Threat Simulator Development, was migrated into PE27601F in FY00 and FY01 for the Joint Modeling and Simulation (JMASS) program development.

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Exhibit R-2 (PE 0207601F)

RDT&E BUDGET ITE	EM JUS	TIFICAT	TON SH	IEET (R	-2A Exh	ibit)		DATE Fe l	bruary 19	999
BUDGET ACTIVITY 7 - Operational System Development		UMBER AND 07601F \		ation	PROJECT 1008					
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
1008 National Air and Space Warfare Model (NASM)	14,530	12,756	12,605	12,016	11,275	7,461	7,617	7,775	Continuing	Continuing

(U) A. Mission Description

This program provides funds for Air Force and Joint wargaming architecture and model development, primarily in support of battlestaff training, education, and military operations. A new wargaming model, NASM, is being developed to replace the existing Air Force standard Air Warfare Simulation (AWSIM). NASM will expand the use and role of modeling and simulation (M&S) in support of operational and acquisition decision making, and increase the interoperability between Air Force and joint efforts. NASM includes an overall USAF M&S architecture and provides a reusable, portable, scaleable, robust distributed core for other simulations. It includes an air combat resolution model to meet the needs of USAF MAJCOMs and Unified/Specified Command air components to train Air Component Commanders and their battle staffs. Primary users will be the unified command air components, Commanders in Chief (CINCs), Joint Forces Air Component Commander's (JFACC), and Service components, as supported by BLUE FLAG and WPC for use in joint exercises involving air, ground, and sea campaigns. NASM is the air component portion of the DoD, Joint Staff and Services Joint Simulation System (JSIMS) which includes Enterprise partner programs from the Joint Staff, Army, Navy (and USMC), DIA, NRO and NSA under CINC ACOM sponsorship.

(U) FY 1998 (\$ in Thousands):

- (U) \$ 9,553 Continue development of specific air objects to support JSIMS architecture
- (U) \$ 3,441 Continue NASM integration effort and operate the program management office
- (U) \$ 1,536 Implement, test, field and support configuration control board (CCB) approved Re-Engineered AWSIM
- (U) \$ 14,530 Total

(U) FY 1999 (\$ in Thousands):

- (U) \$ 9,027 Continue development of specific air objects to support JSIMS architecture
- (U) \$ 2,701 Continue NASM integration effort and operate the program management office
- (U) \$ 1,028 Support and configuration manage the re-engineered AWSIM
- (U) \$ 12,756 Total

Project 1008 Page 3 of 12 Pages Exhibit R-2A (PE 0207601F)

RDT&E	DATE February 1999											
BUDGET ACTIVITY 7 - Operational System	Development	PE NUMBER AND TITLE 0207601F USAF Modeling And Sin	PROJECT 1008									
(U) \$10,428 Contin(U) \$ 2,220 Contin	 (U) \$ 2,220 Continue NASM integration effort and operate the program management office (U) \$ 957 Support and configuration manage the re-engineered AWSIM 											
– (U) \$ 1,813 Contin	nds): nue development of specific air objects to support nue NASM integration effort and operate the prog ort and configuration manage the re-engineered A	gram management office										
	ry - Description of Significant Changes None g Summary (\$ in Thousands) None											
Project 1008	Page	e 4 of 12 Pages Ex	hibit R-2A (PE 0207601F)									

DATE RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) February 1999 **BUDGET ACTIVITY** PE NUMBER AND TITLE **PROJECT** 1008 7 - Operational System Development 0207601F USAF Modeling And Simulation (U) D. Acquisition Strategy NASM provides the Air and Space software components of the Joint Simulation System (JSIMS). Resources are reviewed and measured against an Enterprise program baseline, with the Earned Value and performance measurement reporting against the baseline accomplished on a monthly basis. The contract was selected by source selection and is a Cost Plus Award Fee (CPAF). (U) E. Schedule Profile (U) AWSIM Re-engineering (U) Initial Op Capability (IOC) 3QFY01 X (U) Full Op Capability (FOC) 4QFY03 NASM development schedule is aligned with the Joint Simulation System (JSIMS) Acquisition Program Baseline (APB) development schedule required to achieve Initial Operational Capability (IOC) in FY01 and Full Operational Capability (FOC) in FY03. Project 1008 Page 5 of 12 Pages Exhibit R-2A (PE 0207601F)

RD	T&E PROG	RAM ELE	EMENT/P	ROJECT	COST B	REAKD	OWN (R-	3)	DATE F (ebruary 19	999
BUDGET ACTIVITY 7 - Operation	al System De	velopment				R AND TITLE 1F USAF	Modeling	And Simu	lation		PROJECT
(U) A. Project C	ost Breakdown (\$	in Thousands	s)								
National Air & Spa			_	FY 1998	3 FY	1999	FY 2000	FY 2001			
(U) Cost Categorie (U) a. Software de (U) c. Program M (U) Total	es: evelopment			10,831 3,699 14,530	1	0,042 2,714 2,756	10,428 3,177 13,605	9,329 2,687 12,016			
(U) B. Budget A	cquisition History	and Planning	Information	(\$ in Thousan	<u>ds)</u>						
Performing Organ	nizations:										
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performin g Activity EAC	Project Office <u>EAC</u>	Total Prior to FY 1998	Budget <u>FY 1998</u>	Budget FY 1999	Budget FY 2000	Budget <u>FY 2001</u>	Budget to Complete	Tota <u>Prograr</u>
	oment Organization										
Raytheon (NASM)	TRN	3 Mar 97	74,541	74,541	7,882	9,253	9,242	10,028	9,029	29,107	74,54
Raytheon (AWSIM/R)	TRN	7 Apr 94	9,876	9,876	9,313	2,141	0	0	0	0	9,87
Hughes (AWSIM/R)	TRN	2 Jun 94	4,676	4,676	4,059	0	0	0	0	0	4,67
TRW (AFSOM)	TRN	12 Dec 97	39	39	0	39	0	0	0	0	3
	agement Organiza										
Tech Eng Mgt Spt (TEMS)	Del Order	1 Feb 94	15,413	15,413	6,330	1,752	1,459	1,471	1,239	3,161	15,413
Project 1008				Pac	ge 6 of 12 Pa	905		Exhi	bit R-3 (PF	0207601F)	

RD	T&E PROG	RAM ELE	MENT/P	ROJECT	COST BI	REAKDO	WN (R-3	3)	DATE F (ebruary 19	999
BUDGET ACTIVITY 7 - Operation	al System De	velopment	1		PE NUMBER 020760 2		Modeling	And Simu	ulation		ROJECT 008
Contractor or Government Performing Activity MITRE	Contract Method/Type or Funding Vehicle Contract Mod	Obligation <u>Date</u> 11 Aug 94	Performin g Activity EAC 13,200	Project Office EAC 13,200	Total Prior to FY 1998 4,269	Budget <u>FY 1998</u> 1,600	Budget <u>FY 1999</u> 1,459	Budget <u>FY 2000</u> 1,471	Budget FY 2001 1,239	Budget to Complete 3,161	Total Program 13,200
Other* *Includes Prototype	Various	Various	19,180	19,180	16,765	347	361	383	338	963	19,180
Test and Evaluation None											
Total Project			137,225	137,225	48,618	14,530	12,756	13,605	12,016	35,700	137,225
Government Furn	nished Property:										
Item Description	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Delivery <u>Date</u>		Total Prior to <u>FY 1998</u>	Budget <u>FY 1998</u>	Budget <u>FY 1999</u>	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to Complete	Total <u>Program</u>
Product Developme None	ent Property										
Support and Manag None	gement Property										
Test and Evaluation None	n Property										
Project 1008				Pa	ge 7 of 12 Pag	ges		Exh	ibit R-3 (PE	0207601F)	

RDT&E BUDGET IT	EM JUS	TIFICAT	ION SI	HEET (R	-2A Exh	DATE February 1999				
BUDGET ACTIVITY 7 - Operational System Developmen		PE NUMBER AND TITLE 0207601F USAF Modeling And Simulation						ргојест 4567		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4567 Joint Modeling and Simulation System (JMASS)	0	1,722	5,69	5,766	3,780	3,872	3,952	4,035	Continuing	Continuing

(U) A. Mission Description

The Joint Modeling & Simulation System (JMASS) is a simulation support environment for the development, configuration, execution, and analysis of high fidelity, repeatable simulations with re-usable models—focus is tactical/engagement level simulations with the present concentration on electronic combat. JMASS is a full system software implementation of a modern object based simulation architecture. JMASS provides users with the tools to: Develop objects, assemble these objects into models, configure the models in a complete simulation, execute the simulation, and post process the simulation data. JMASS tools assist users in developing fully compliant objects; users concentrate on the models and analysis, not computer science.

(U) FY 1998 (\$ in Thousands):

- (U) \$0 Not Applicable

(U) FY 1999 (\$ in Thousands):

- (U) \$ 507 High Level Architecture (HLA) Compliance
- (U) \$ 245 Improved User Interface
- (U) \$ 685 Develop Request For Proposal (RFP) documentation and operate the program management office
- (U) \$ 285 Prototype of JMASS software on a Personal Computer (PC)
- (U) \$1,722 Total

(U) <u>FY 2000 (\$ in Thousands):</u>

- (U) \$ 2,494 JMASS Model Space Object (MSO) development (computer representations of individual DoD weapon systems)
- (U) \$1,700 JMASS Architecture development (Environment, Terrain, Human interaction, background models and simulations)
- (U) \$1,500 JMASS Integration with Other Service Simulations
- (U) \$ 5,694 Total

Project 4567 Page 8 of 12 Pages Exhibit R-2A (PE 0207601F)

DATE RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) February 1999 **BUDGET ACTIVITY** PE NUMBER AND TITLE **PROJECT** 0207601F USAF Modeling And Simulation 4567 7 - Operational System Development (U) FY 2001 (\$ in Thousands): JMASS Model Space Object (MSO) development (computer representations of individual DoD weapon systems) (U) \$4,000 JMASS Architecture development (Environment, Terrain, Human interaction, background models and simulations) (U) \$1,000 JMASS Integration with Other Service Simulations (U) \$ 766 Total (U) \$5,766 (U) B. Project Change Summary - Description of Significant Changes PE 64256F, Threat Simulator Development, transferred \$2.1M in FY00 and FY01 for JMASS Joint Program Development in FY00 POM. (U) C. Other Program Funding Summary (\$ in Thousands) To Total FY 1998 FY 1999 FY 2000 FY 2001 FY 2002 FY 2003 FY 2004 FY 2005 Compl Cost (U) PE64256F, Threat Simulator Development 25,899 4,090 4.100 Continue Project 3321 (EW Test Resources) Project 4567 Page 9 of 12 Pages Exhibit R-2A (PE 0207601F)

RD1&E BUDGET ITEM JUSTIFICATION SHEET (R-2A EXHIBIT)													February 1999			
BUDGET ACTIVITY 7 - Operational System Deve	elopment								Mode	ling Ar	nd Sin	nulat	ion			ROJECT 567
(U) D. Acquisition Strategy All major contracts for JMASS model of	development	within th	is BPA	∆C will \	be award	ded after	full an	d open o	competit	ion.						
(U) E. Schedule Profile																
		<u>FY 19</u>	9 <u>98</u>			<u>FY 1</u> 2	999			FY 20	<u>00</u>			FY 20		
(U) Milestone 2 - RFP (U) Contract Award (U) Initial Delivery	1	2	3	4	1	2	3 X	4	1	2 X	3	4	1	2	3	4 X
Project 4567					Page 1	0 of 12 I	Pages				Ex	hibit R	:-2A (P	E 02076	601F)	

RI	OT&E PRO	GRAM EL	EMENT/F	PROJE	CT COS	T BF	EAKD	OWN (R-	3)	DATE F	ebruary 1	999
BUDGET ACTIVITY 7 - Operation	nal System D	evelopmer	nt				AND TITLE F USAF	- Modeling	J And Simul	ation		PROJECT 4567
(U) A. Project (Cost Breakdown ((\$ in Thousan	ds)		·							
Joint Modeling an			<u>-</u>	FY	7 1998	<u>FY 1</u>	999	FY 2000	FY 2001			
(U) Cost Categor (U) a. Software I (U) b. Contractor (U) c. Program M (U) Total	ies Development r Support				0 0 0 0	1.	030 240 452 722	4,394 1,000 300 5,694	4,266 1,000 500 5,766			
(U) B. Budget A	cquisition Histor	ry and Plannii	ng Information	n (\$ in Tho	ousands)							
Performing Orga	nnizations:											
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	To Prior <u>FY 19</u>		Budget FY 1998	Budget <u>FY 1999</u>	Budget FY 2000	Budget FY 2001	Budget to Complete	Tota <u>Program</u>
Product Developm Various	nent Organization Various	<u>s</u>				0	0	1,722	5,694	5,766	continuing	continuing
Support and Mana None	agement Organiza	ntions _										
Test and Evaluation	on Organizations											
Project 4567					Page 11 of	12 Pag	es		Exhil	oit R-3 (PE	E 0207601F))

R	DT&E PROG	RAM EL	EMENT/PRO	DJECT COST BE	REAKDO	DATE February 1999				
BUDGET ACTIVITY 7 - Operatio	nal System De	evelopmen	t	PE NUMBER 0207601	AND TITLE	ılation	PROJE lation 4567			
(U) B. Budget	Acquisition History	y and Plannin	g Information Co	ntinued (\$ in Thousands	<u>s)</u>					
Government Fu	rnished Property:									
Item <u>Description</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Delivery <u>Date</u>	Total Prior to <u>FY 1998</u>	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Tota <u>Progran</u>
Product Develop None	ment Property									
Support and Mar None	nagement Property									
Test and Evaluat None	ion Property									
Subtotal Product Subtotal Support Subtotal Test and	and Management			0	0	1,722	5,694	5,766	continuing	continuin
Total Project				0	0	1,722	5,694	5,766	continuing	continuin
Project 4567				Page 12 of 12 Pag	ges		Exh	ibit R-3 (PE	0207601F)	